Supporting information

Efficient sky-blue emitting Pt(II) complexes based on imidazo[1,2-*f*]phenanthridine-containing tetradentate ligands

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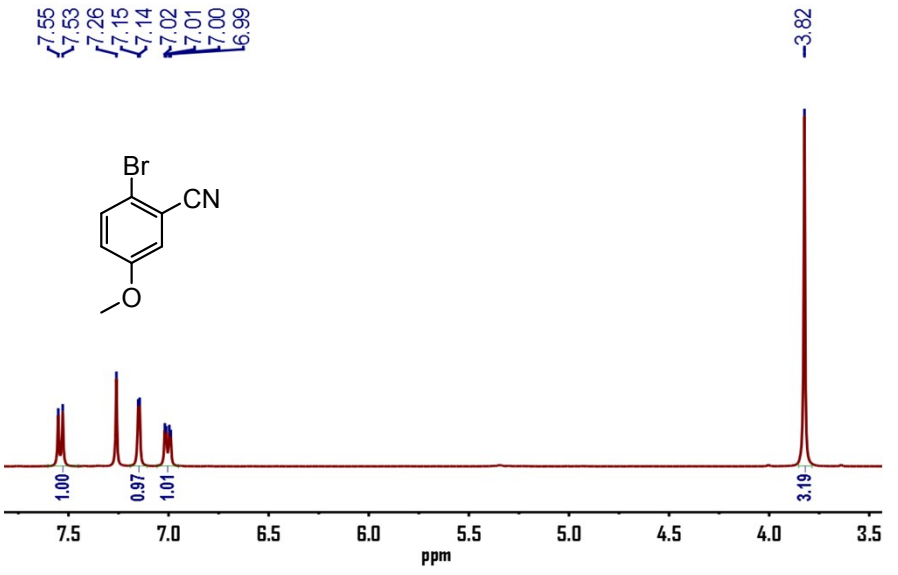

Figure S1. ^{1}H NMR spectrum of 2-bromo-5-methoxybenzonitrile ($CDCl_3$).

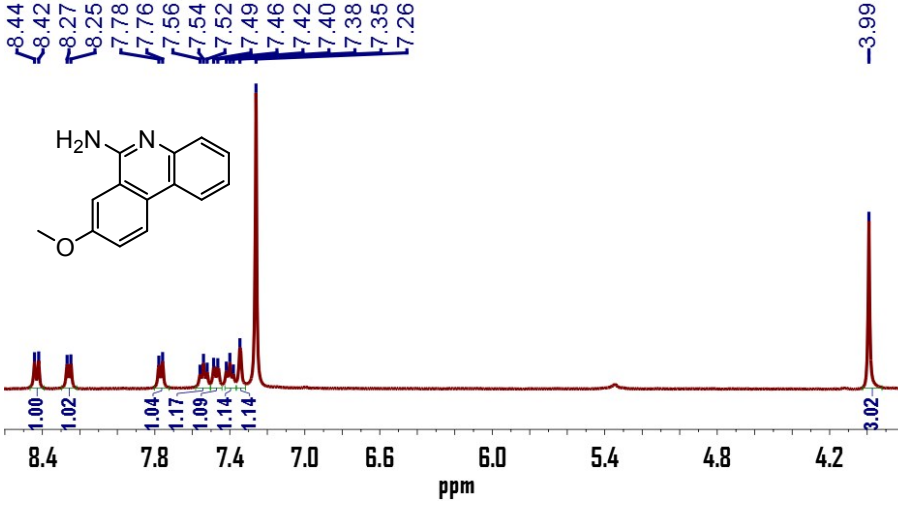

Figure S2. ^{1}H NMR spectrum of 8-methoxyphenanthridin-6-amine ($CDCl_3$).

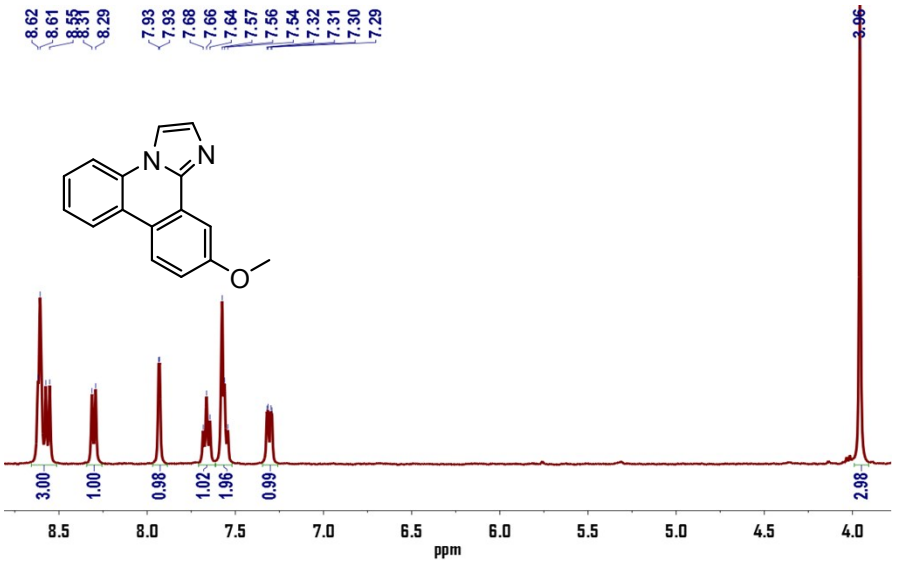

Figure S3. ^{1}H NMR spectrum of 1-methoxyimidazo-[1,2-f]-phenanthridine (DMSO-*d6*).

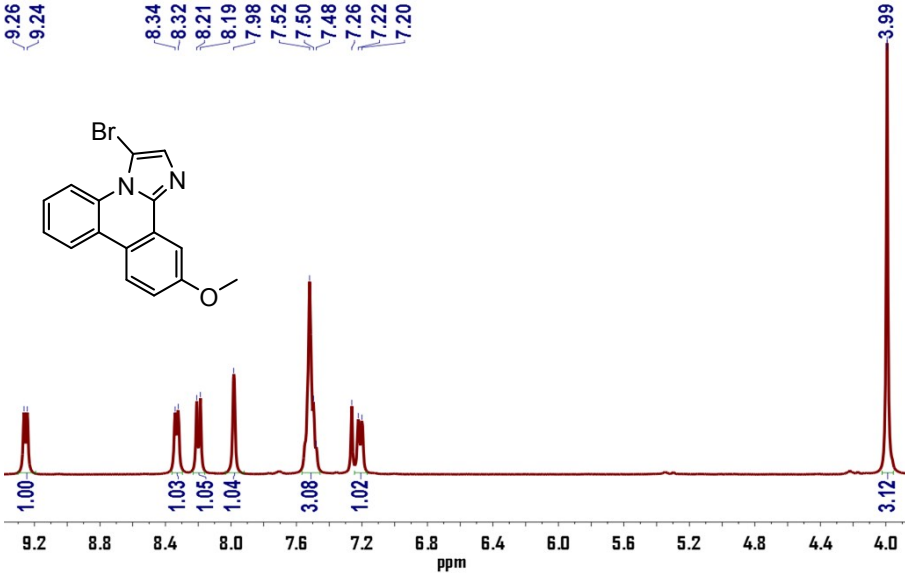

Figure S4. ^{1}H NMR spectrum of 3-bromo-11-methoxyimidazo [1,2-f] phenanthridine ($CDCl_3$).

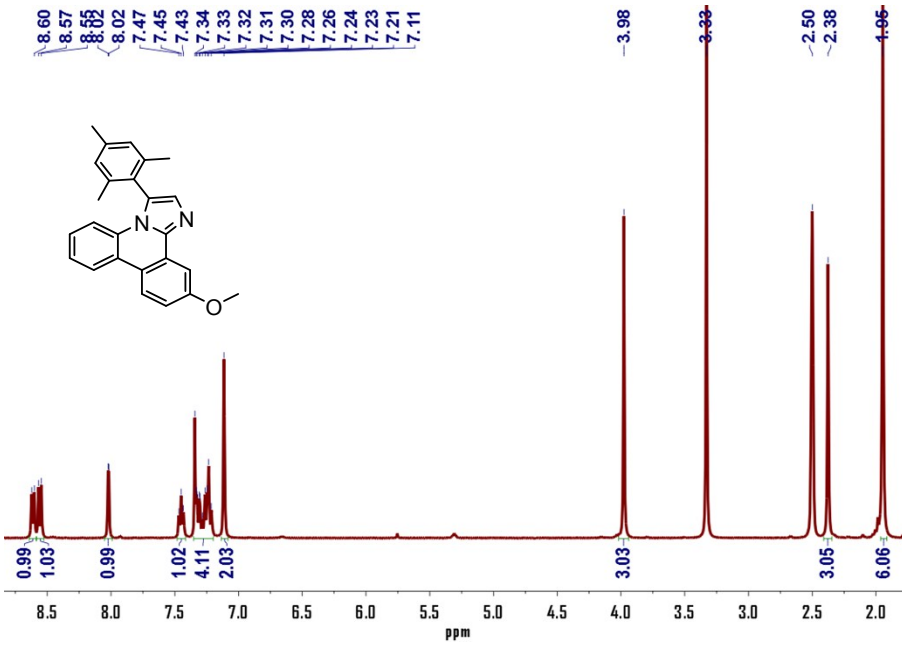

Figure S5. [1]H NMR spectrum of 3-mesityl-11-methoxyimidazo[1,2-f]phenanthridine (DMSO-*d6*).

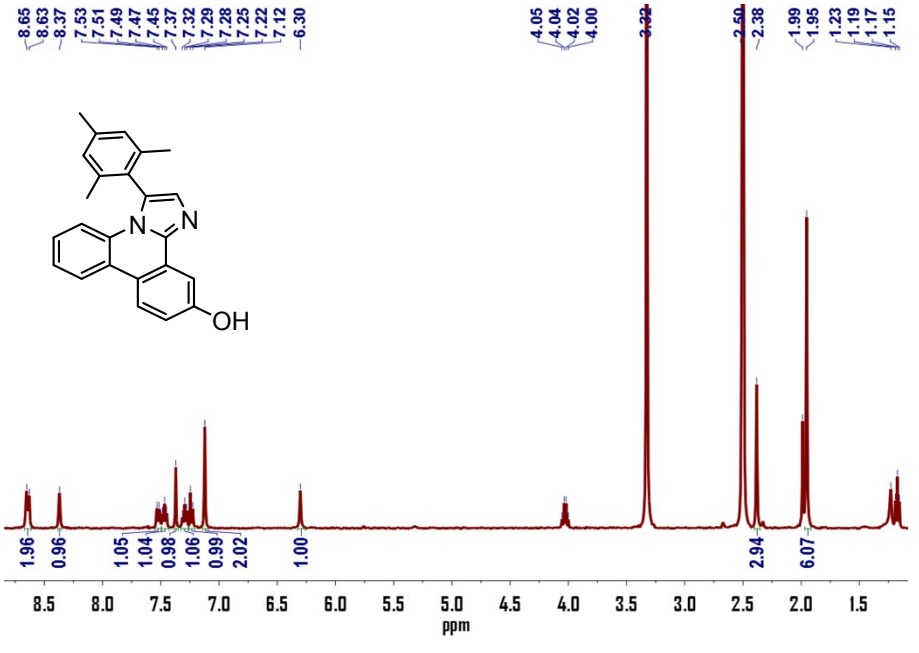

Figure S6. [1]H NMR spectrum of 3-mesitylimidazo [1,2-f]

phenanthridin-11-ol (DMSO-*d6*).

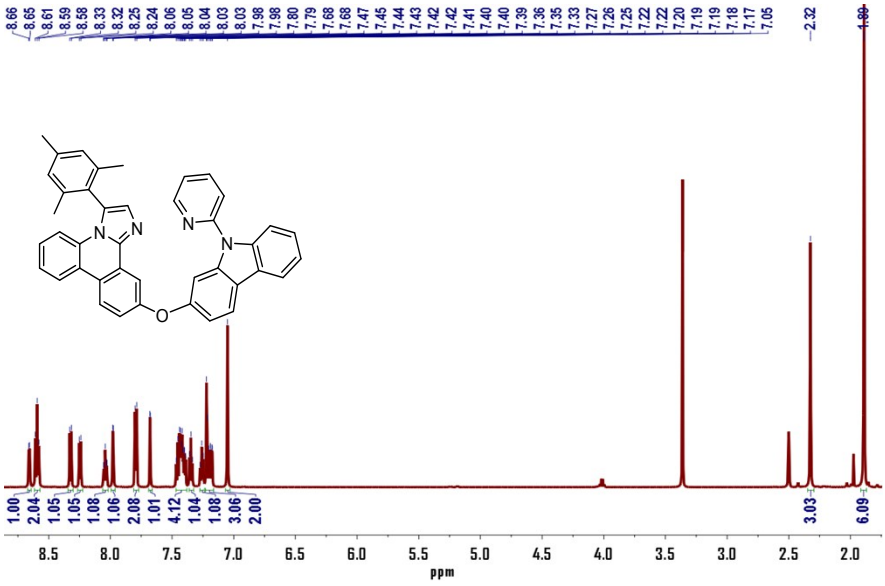

Figure S7. ^{1}H NMR spectrum of L1 (DMSO-*d6*).

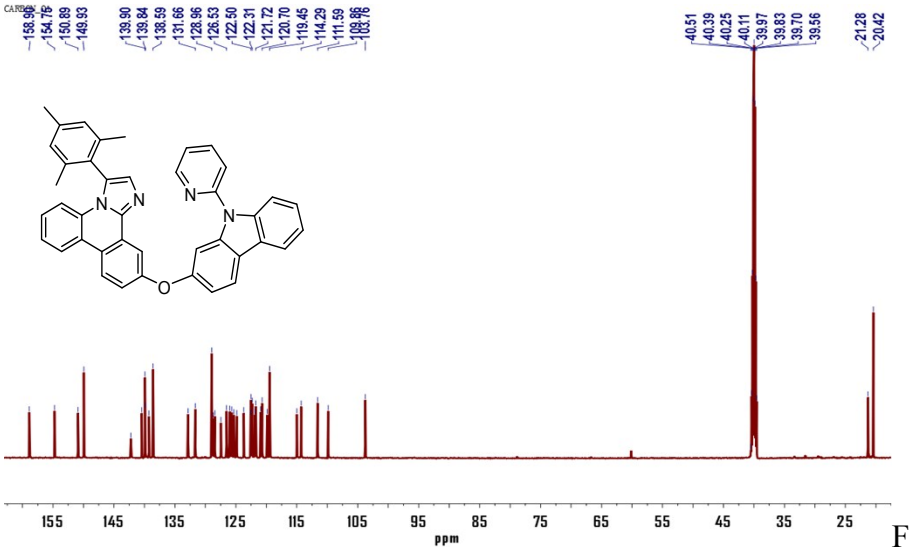

Figure S8. ^{13}C NMR spectrum of ligand of L1 (DMSO-d6).

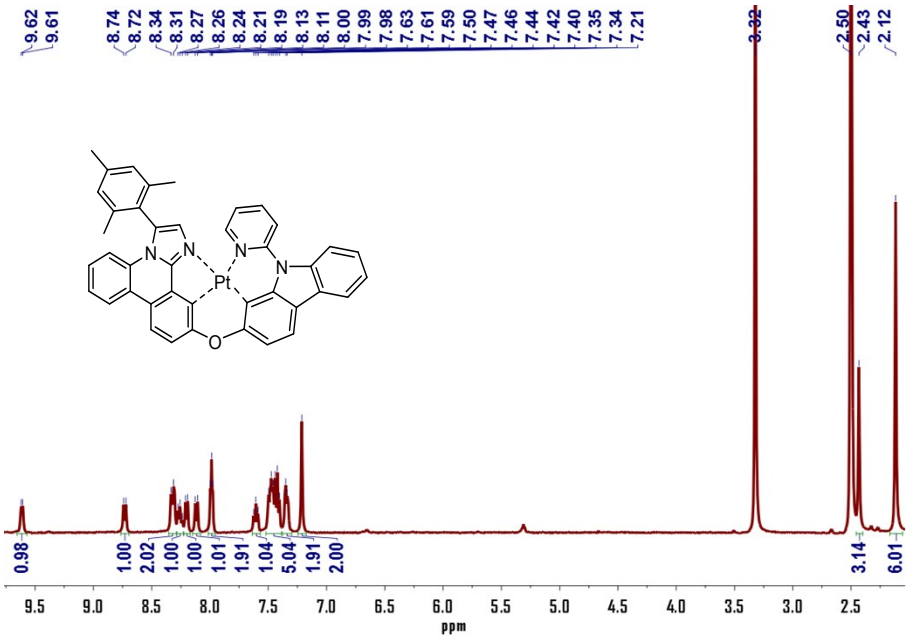

Figure S9. ^{1}H NMR spectrum of Pt1 (DMSO-*d6*).

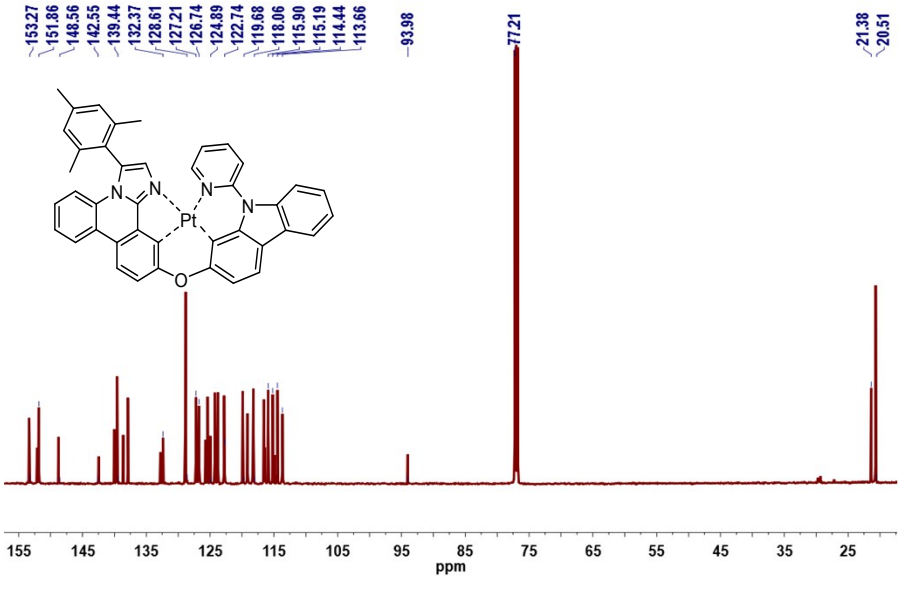

Figure S10. ^{13}C NMR spectrum of Pt1 ($CDCl_3$).

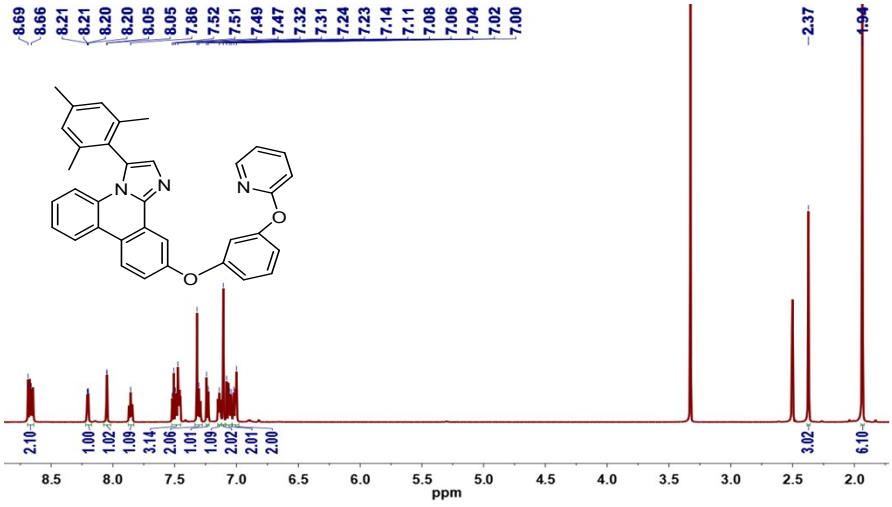

Figure S11. ^{1}H NMR spectrum of L2 (DMSO-*d6*).

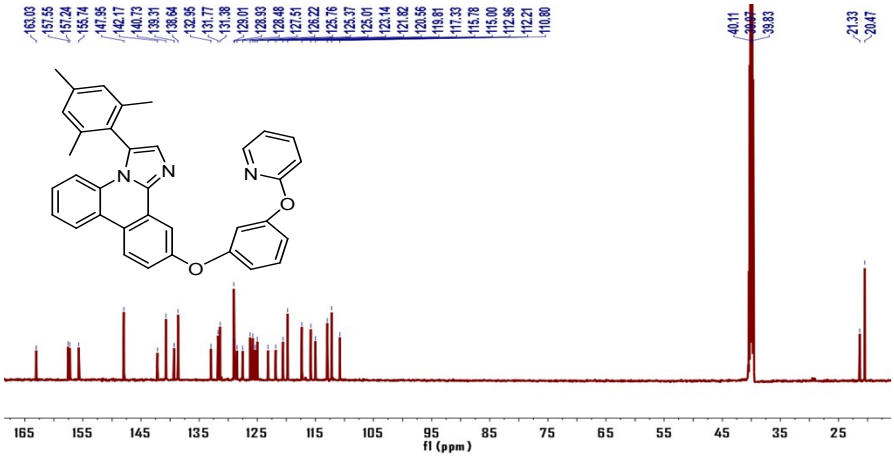

Figure S12. ^{13}C NMR spectrum of L2 (DMSO-*d6*).

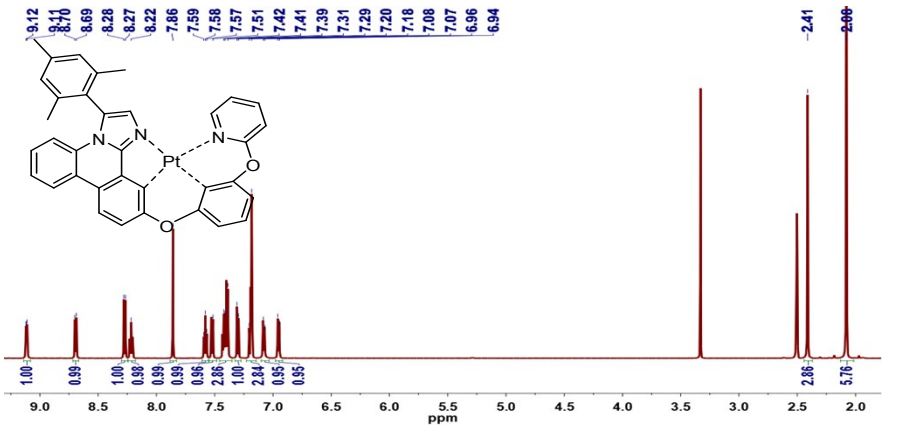

Figure S13. ^{1}H NMR spectrum of Pt2 (DMSO-*d6*).

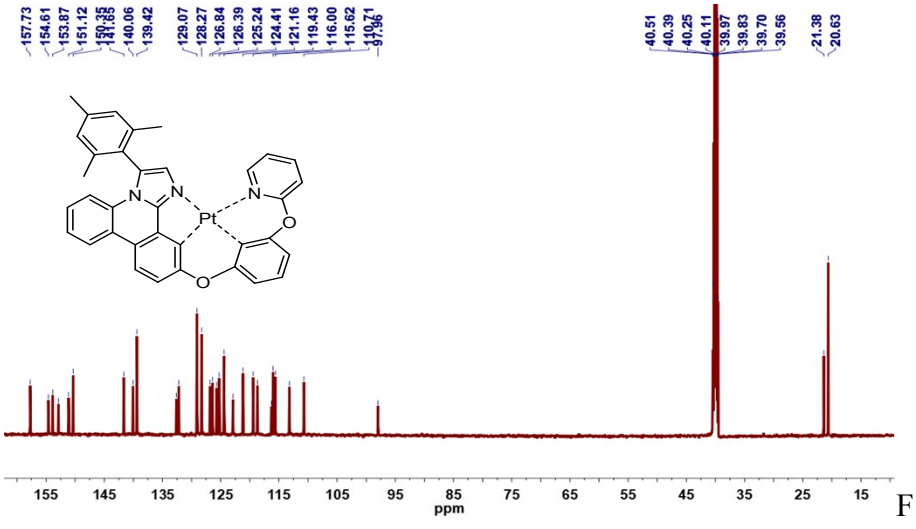

Figure S14. ^{13}C NMR spectrum of Pt2 (DMSO-*d6*).

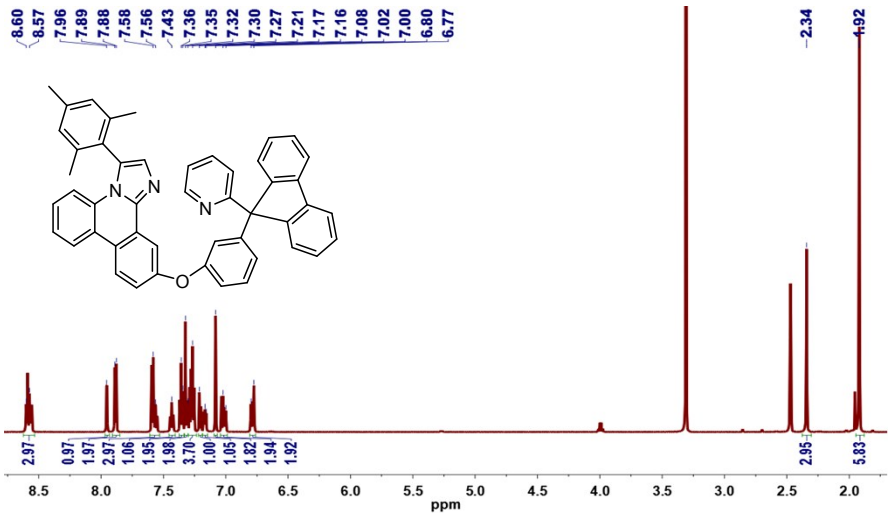

Figure S15. ^{1}H NMR spectrum of L3 (DMSO-*d6*).

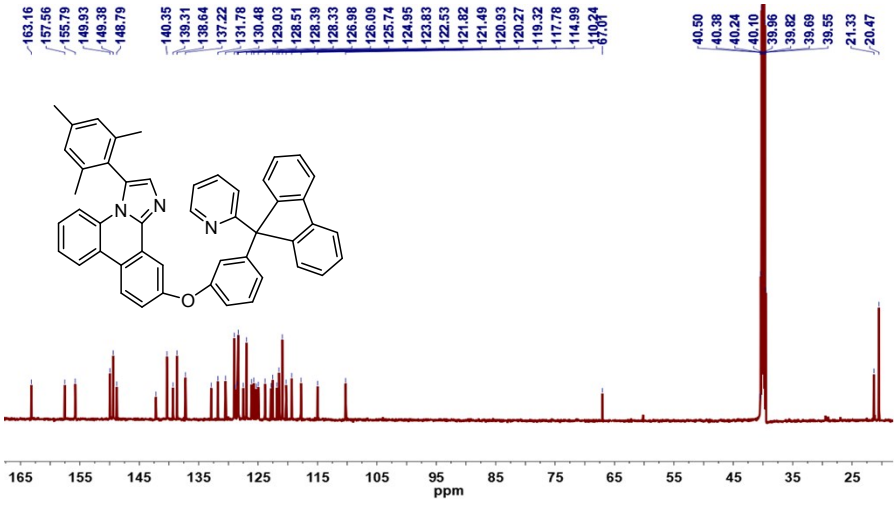

Figure S16. ^{13}C NMR spectrum of L3 (DMSO-*d6*).

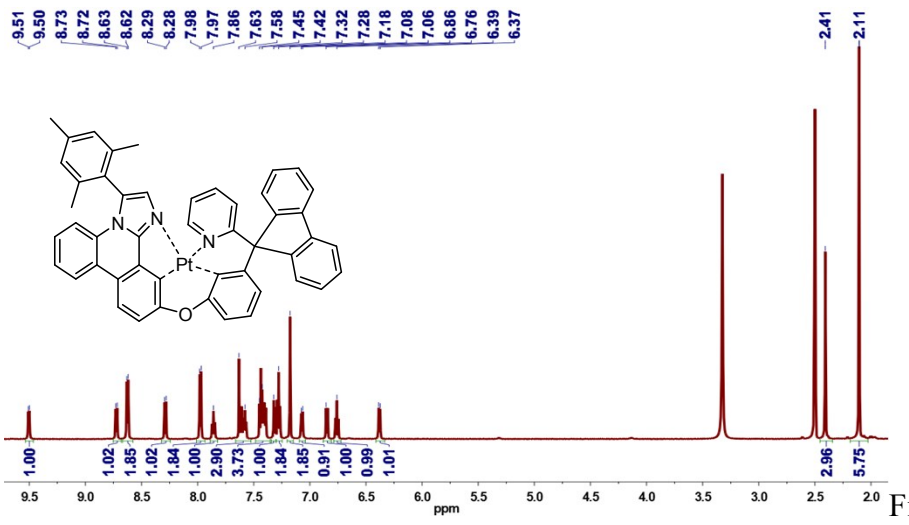

Figure S17. ^{1}H NMR spectrum of Pt3 (DMSO-*d6*).

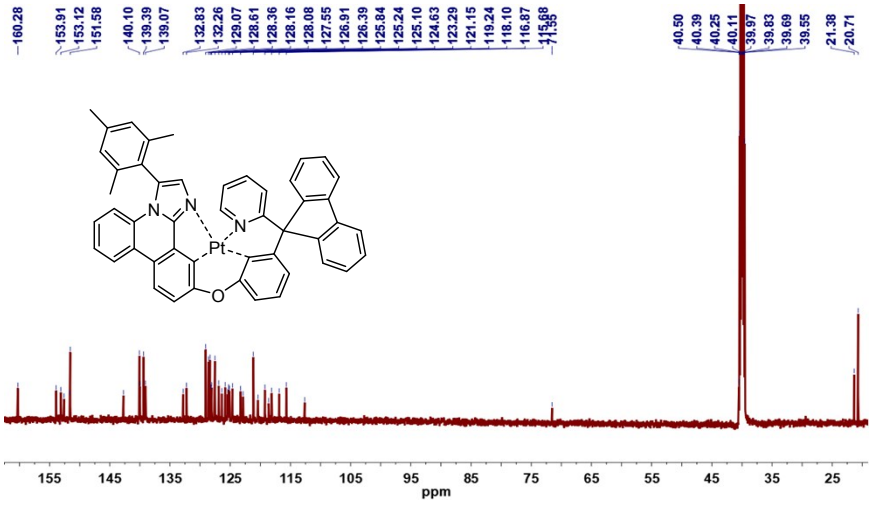

Figure S18. ^{13}C NMR spectrum of Pt3 (DMSO-*d6*).

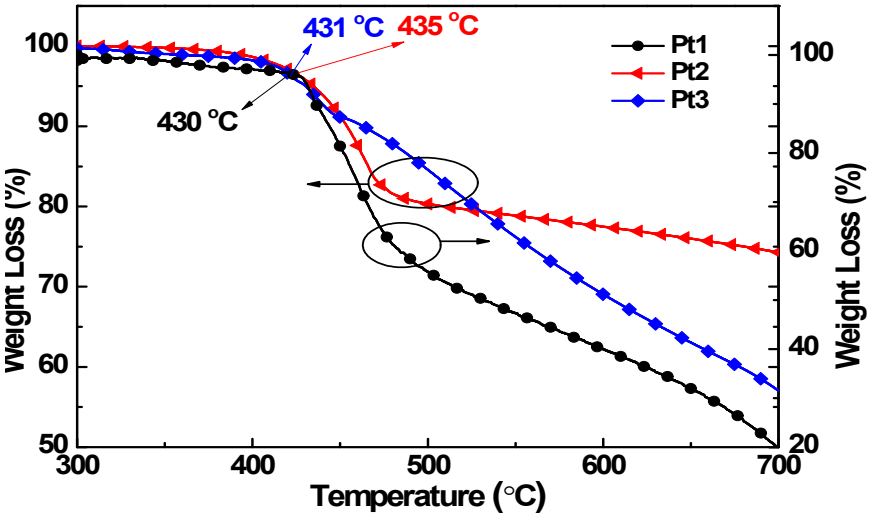

Figure S19. The TGA curves of Pt1, Pt2 and Pt3 at a heating rate of 10 ^{o}C /min under N_2.

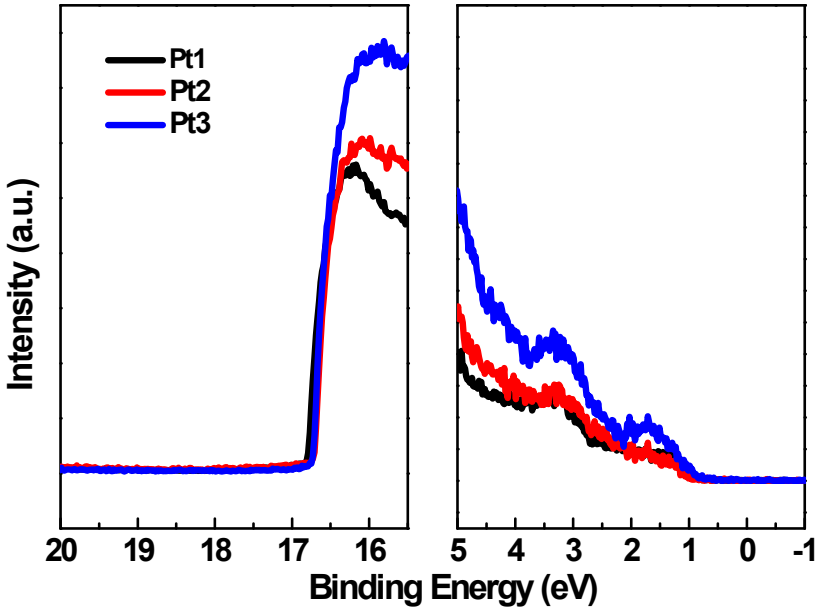

Figure S20. UPS spectra of Pt1, Pt2 and Pt3.

Table S1. Density functional theory (DFT) calculations for complexes Pt1, Pt2, and Pt3.

Compound	LUMO [eV]	HOMO [eV]	E_g [eV]	S_1 [eV]	T_1 [eV]
Pt1	-1.28	-4.74	3.46	2.90	2.68
Pt2	-1.02	-4.75	3.73	3.30	2.79
Pt3	-1.30	-4.72	3.42	2.82	2.68

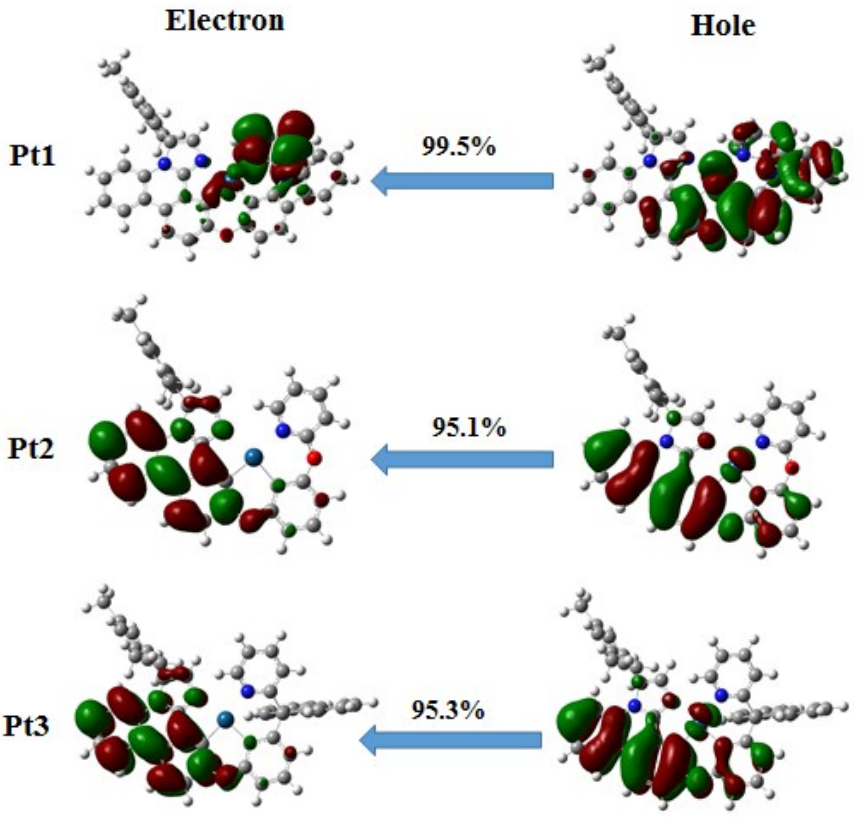

Figure S21. Natural transition orbitals (NTO) analyses for triplet emission of compounds Pt1, Pt2 and Pt3.

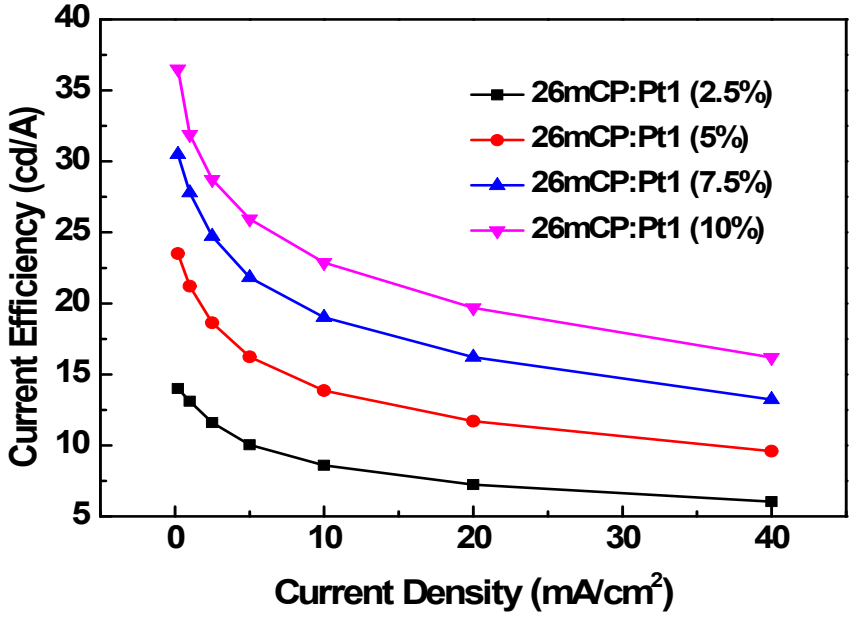

Figure S22. The current efficiency–current density curves for Pt1 at different doping ratios.

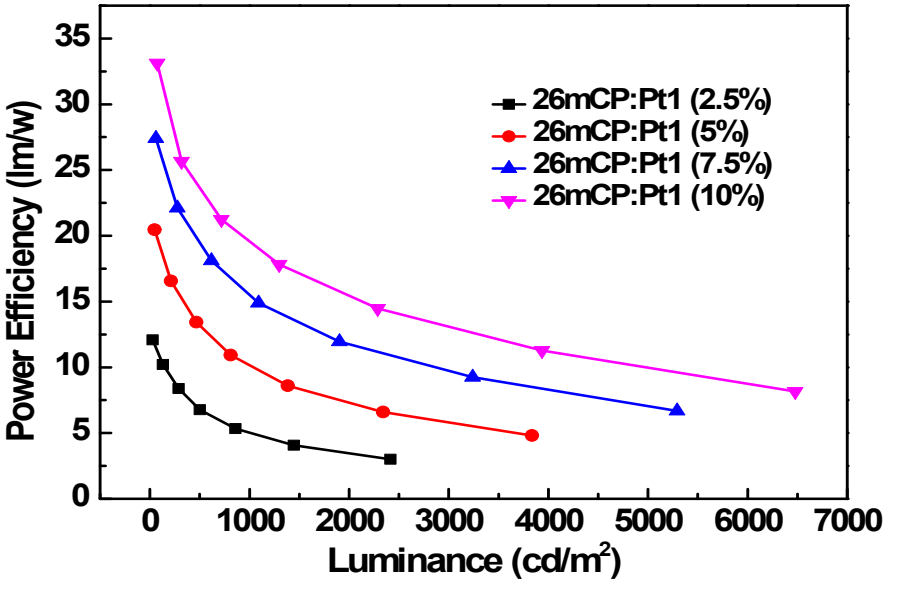

Figure S23. The power efficiency-luminance curves for Pt1 at different doping ratios.

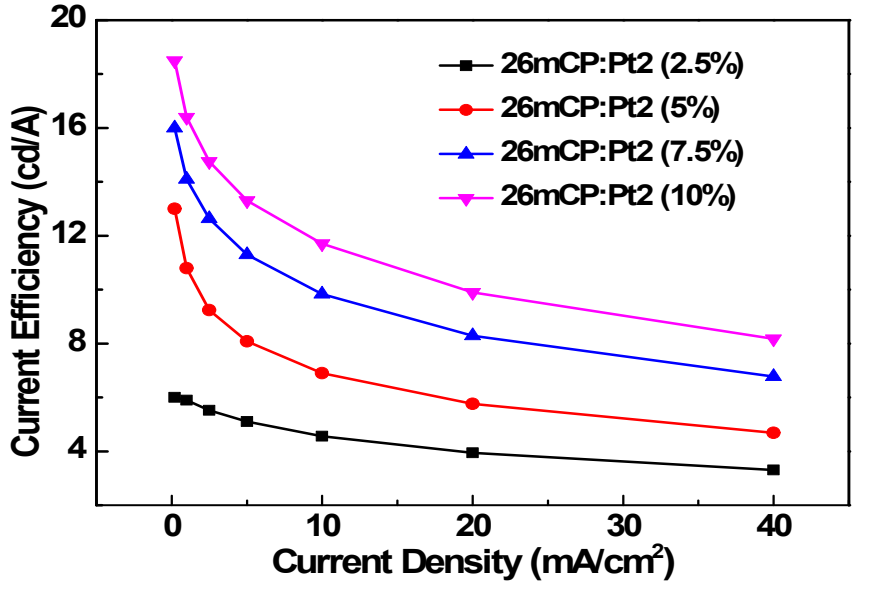

Figure S24. The current efficiency–current density curves for Pt2 at different doping ratios.

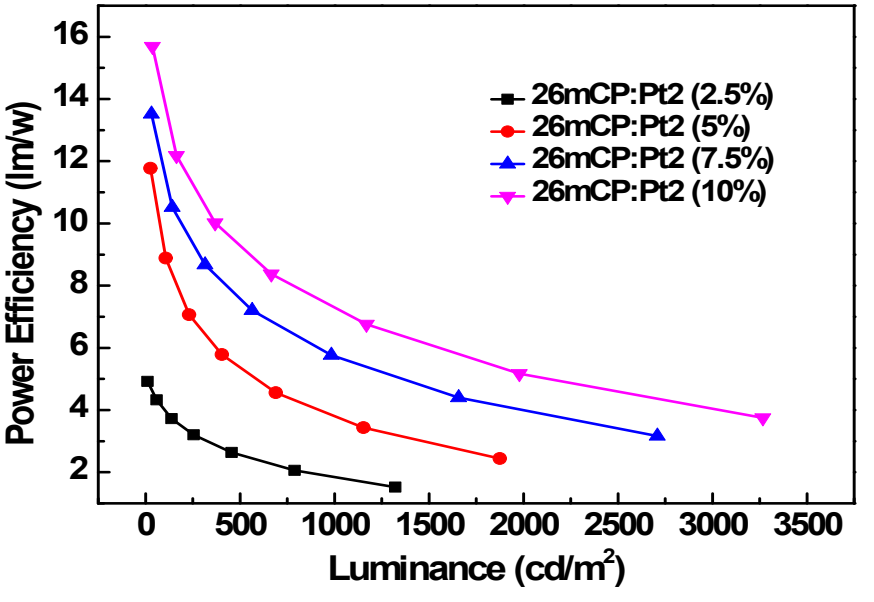

Figure S25. The power efficiency-luminance curves for Pt2 at different doping ratios.

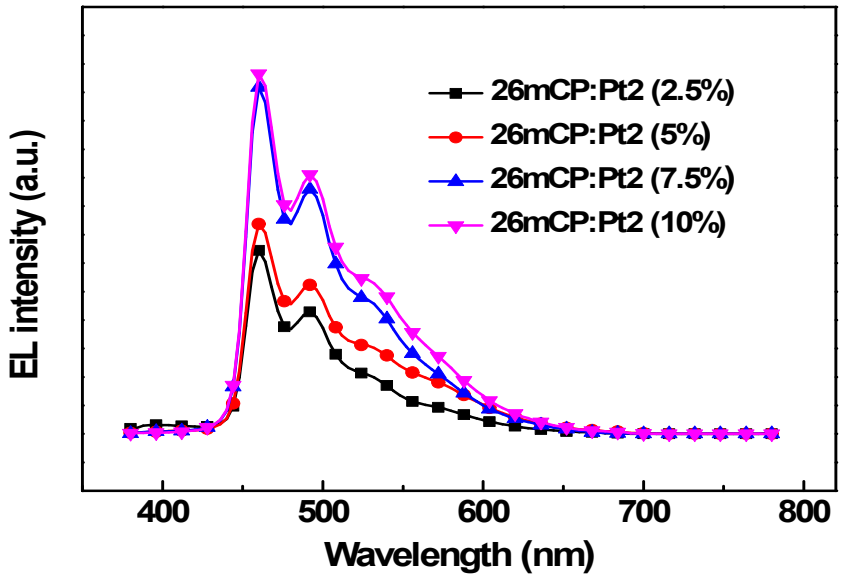

Figure S26. The EL spectra of complex Pt2 with different doping ratios at 5 mA/cm^2.

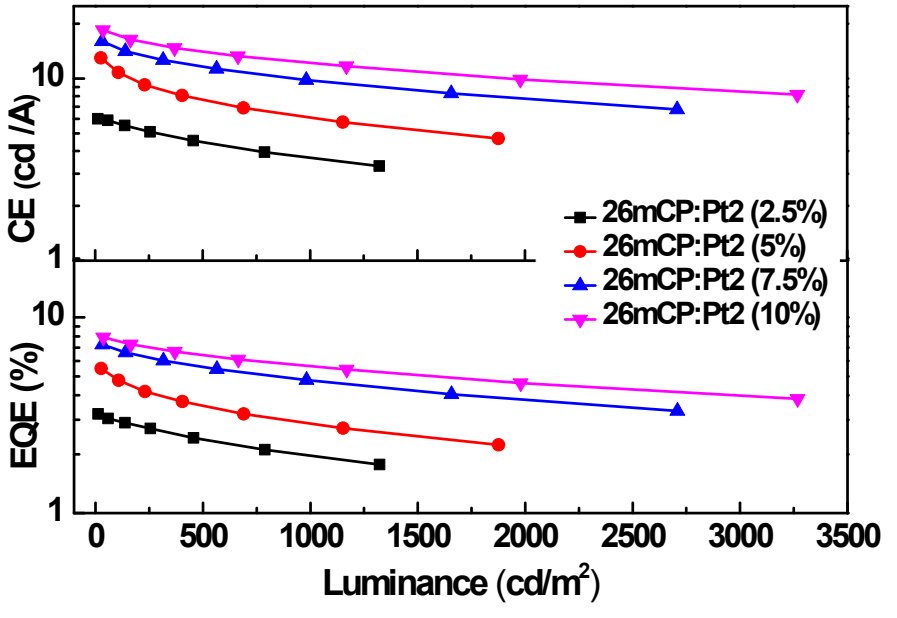

Figure S27. The EQE-luminance-current efficiency curves for Pt2 at different doping ratios.

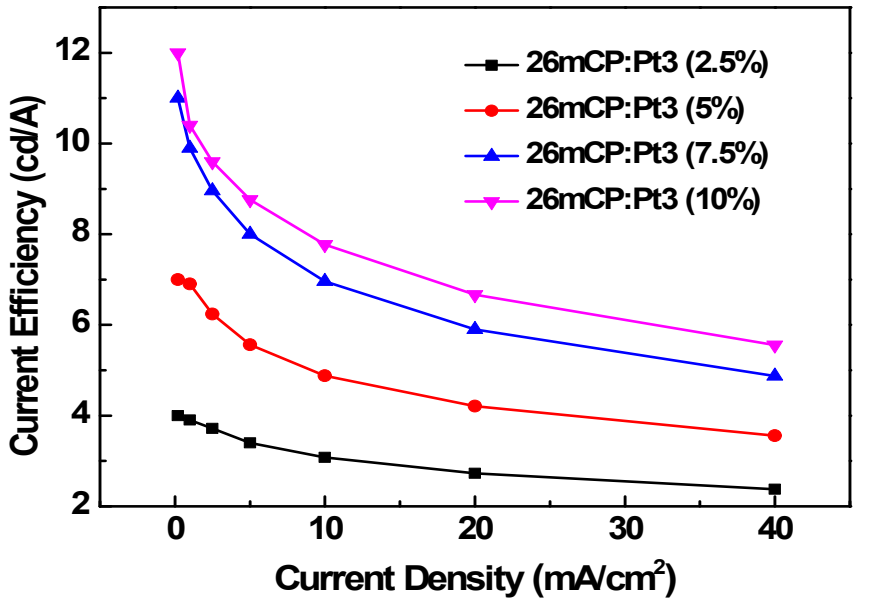

Figure S28. The current efficiency–current density curves for Pt3 at different doping ratios.

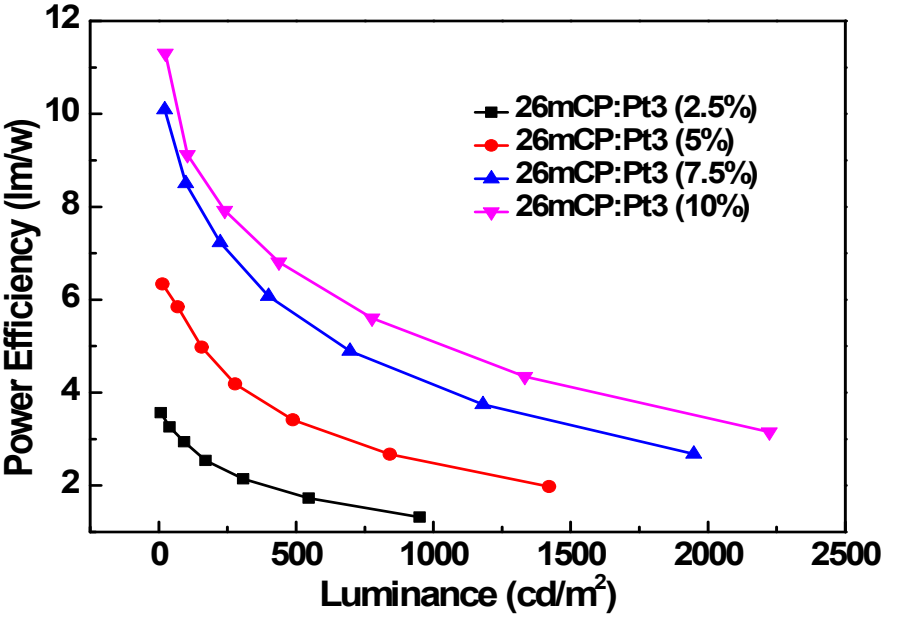

Figure S29. The power efficiency-luminance curves for Pt3 at different doping ratios .

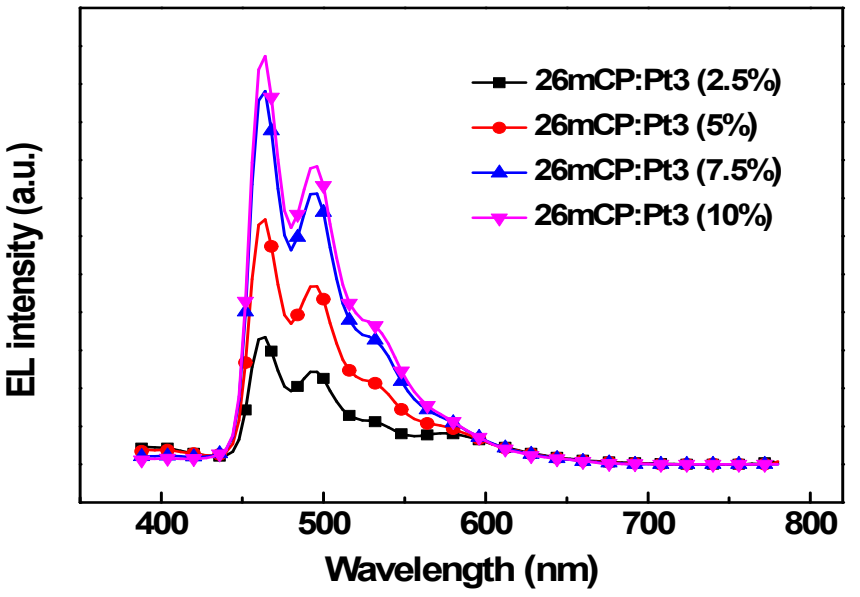

Figure S30. The EL spectra of complex Pt3 with different doping ratios at 5 mA/cm^2.

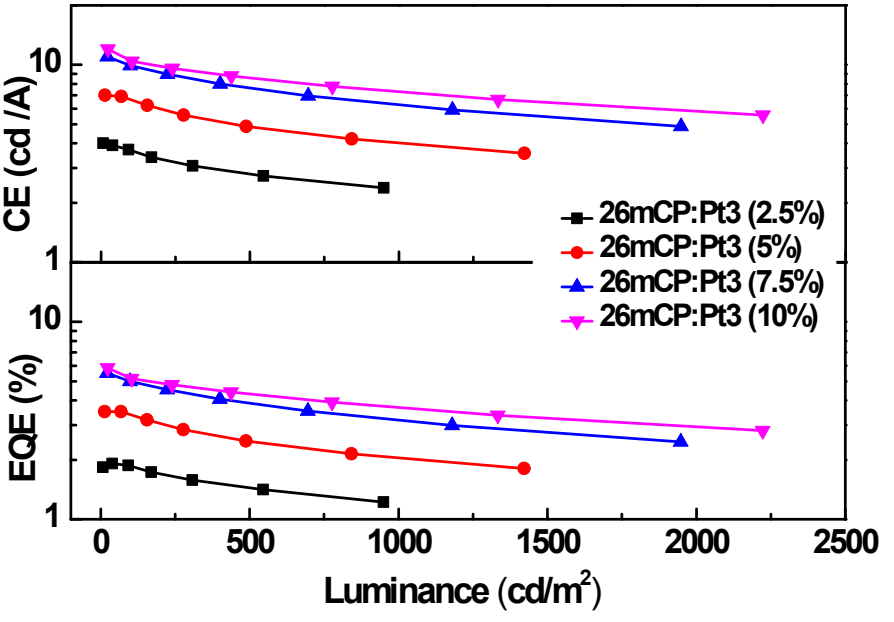

Figure S31. The EQE-luminance-current efficiency curves for Pt3 at different doping ratios.

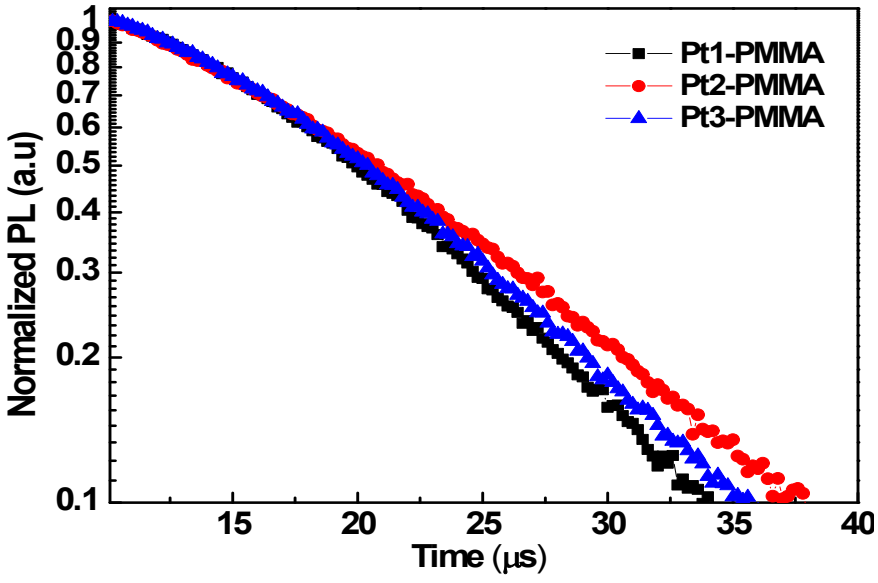

Figure S32. Transient phosphorescence decay of Pt1-Pt3 in a doped PMMA thin film at room temperature.

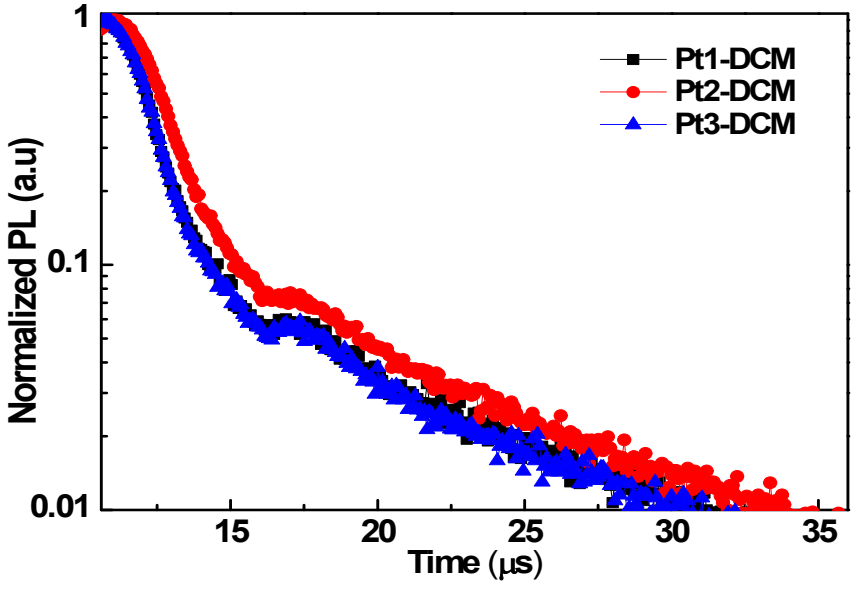

Figure S33. Transient phosphorescence decay of Pt1-Pt3 in degassed dichloromethane at room temperature.

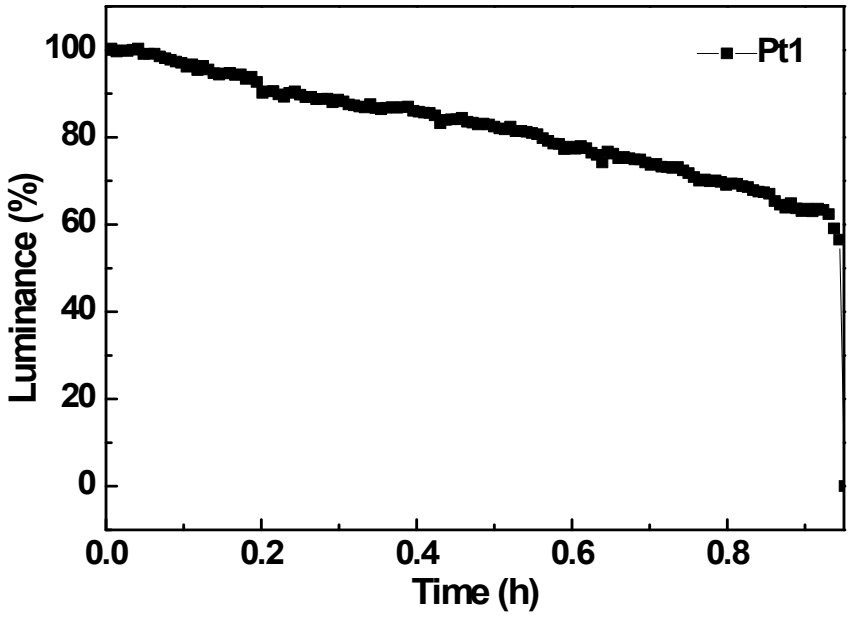

Figure S34. Lifetime curve of Pt1 device at an initial luminance of 1000 cd/m^2.

The operational lifetime of Pt1 based device gave a short T_{50} less than 1 hour at an initial luminance of 1000 cd m^{-2}, possibly due to the poor stability of the blue emitter.